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Title: LANL Robotics

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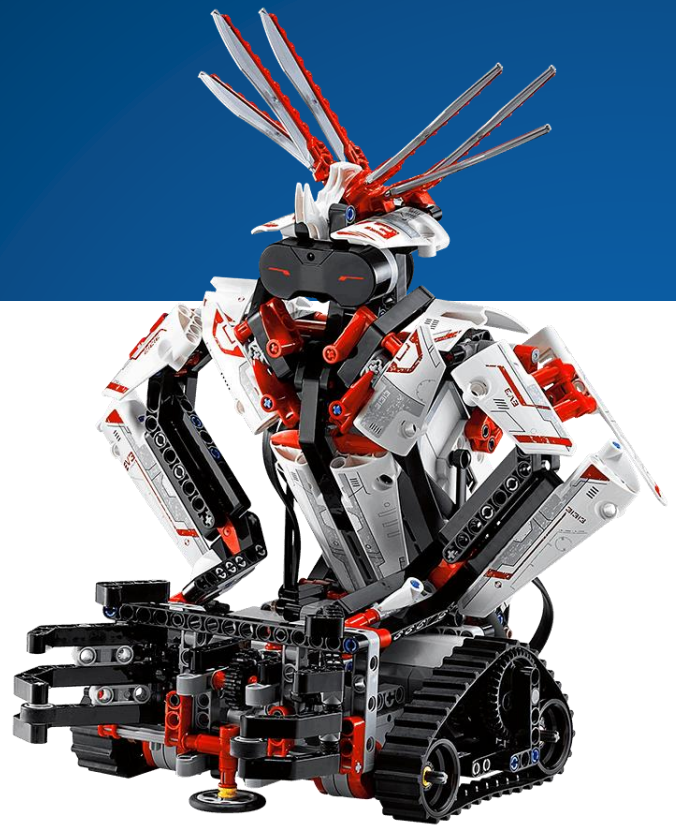
Los Alamos
NATIONAL LABORATORY
EST. 1943

LANL Robotics



Beth Boardman

Applied Engineering & Technology

April 23, 2017

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National Nuclear Security Administration

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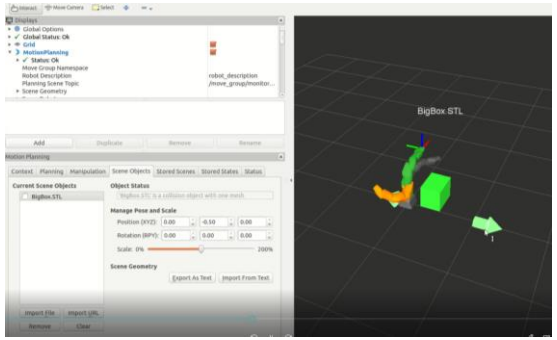
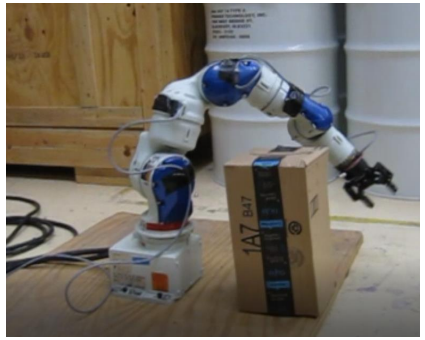
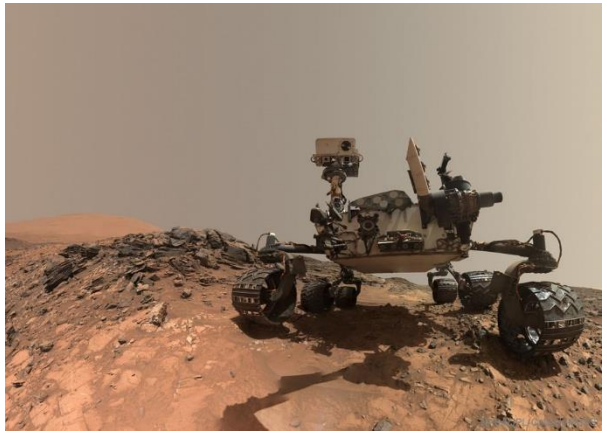
What is Robotics?

- **Automation & Teleoperation**
- **Hardware & Software**
  - Movement using Motors
  - Detection using Sensors
  - Reasoning using Software/Computer







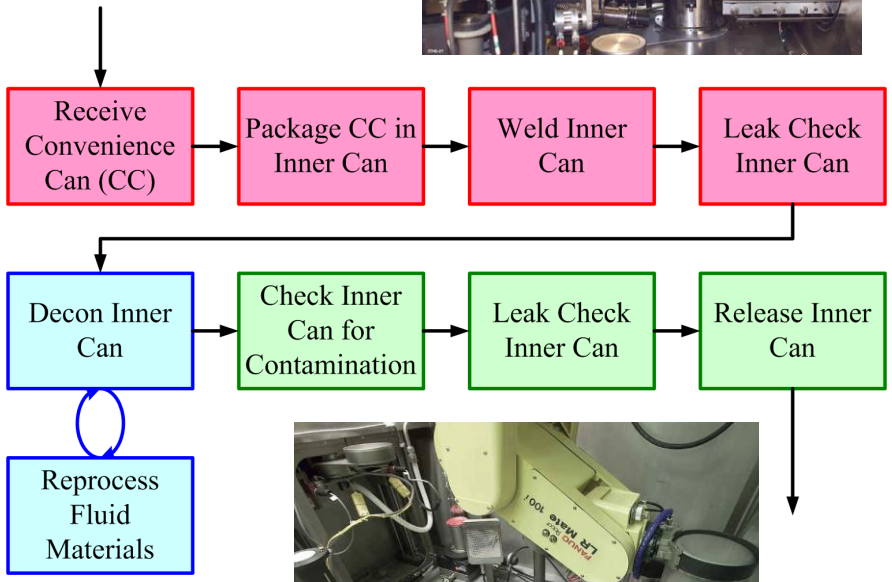
NASA Curiosity Mars Rover

Amazon Prime Air

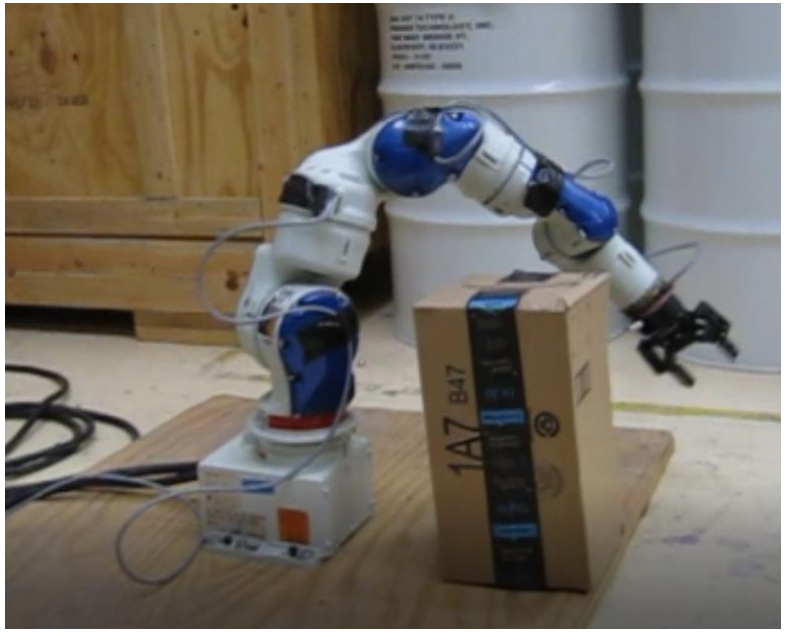
iRobot Roomba

da Vinci Surgical System

Robotics at LANL



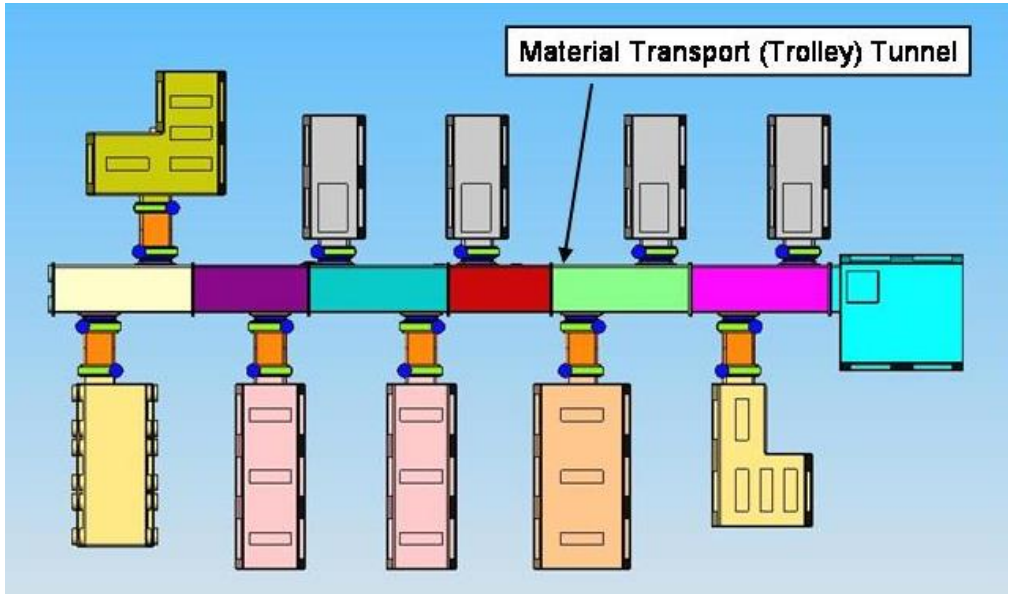
5 DOF industrial robot

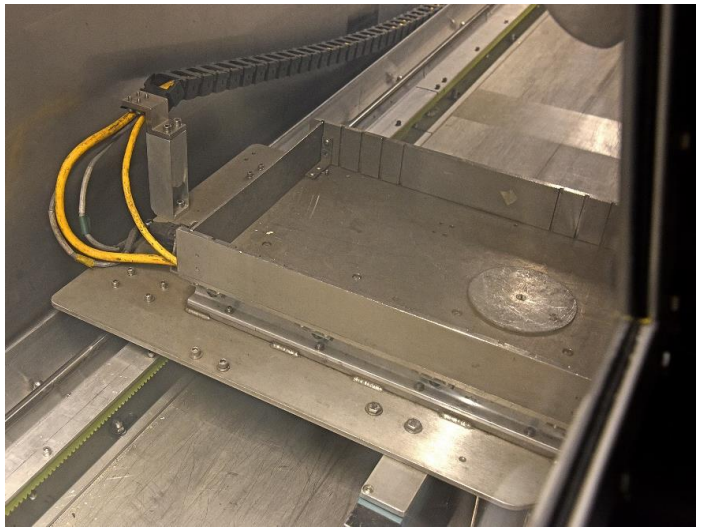


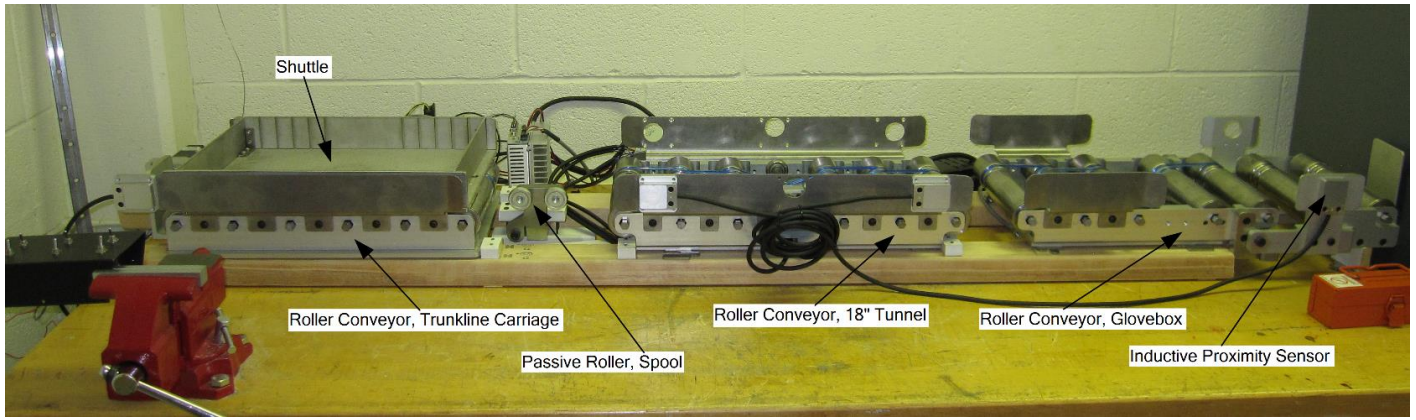
SIA5 7 DOF manipulator demonstrating collision avoidance

3 DOF gantry robot

Conveyor System

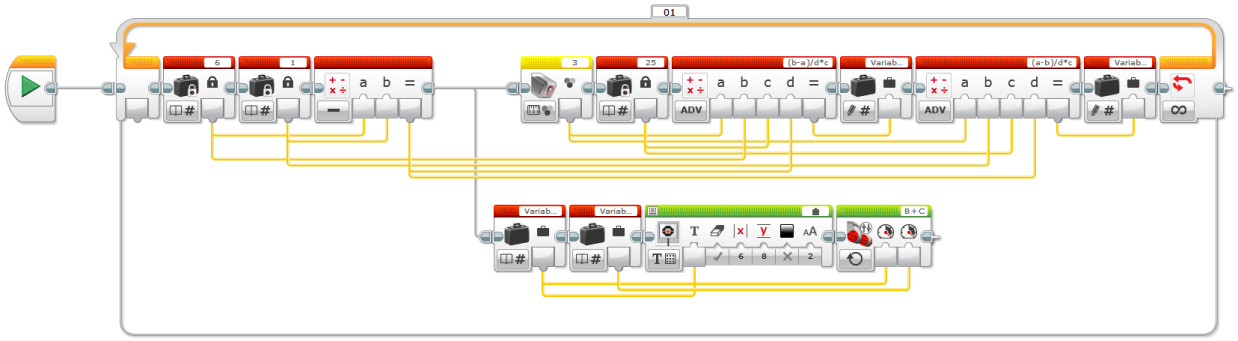




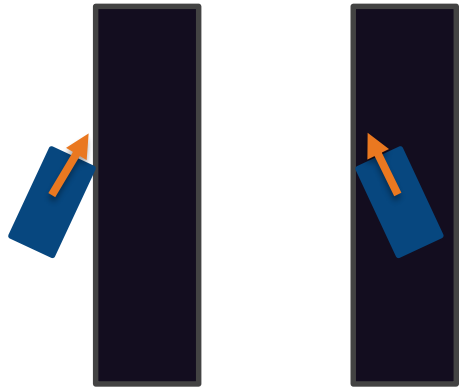


Lego Mindstorm EV3 – Line Follow

- **Mindstorm**
  - Brick, 2 large motors, 1 small motor, color sensor, touch sensor, IR sensor
  - Block language



- **Line Follow algorithm**
  - Use color sensor
    - if white -> move toward black line (turn right)
    - if black -> move toward white (turn left)



Reference: https://sites.google.com/site/gask3t/lego-ev3/my-projects/a-better-line-follower